Our vision is to connect the Design Practice at all phases to the most efficient workflows and processes by providing access to the appropriate set of tools and education.
Seeing
Knowing

Creating **places** that enhance the **human** experience

DATA INTERPRETATION

DATA RESEARCH

FUNCTION MAPPING

SPACE DESIGN

FORM

NEW CREATIVITY & EXISTING BUILT ENVIRONMENT

**data** informs design?

IN [FORM] ED DESIGN
DATA DRIVEN
Creating a Design Intelligence System

INFO. → DATA → KNOWLEDGE → MODEL (BIM) → INFO.
A value within the inter-quartile range shows a project's performance in a metric is consistent with the performance of others in the data set. A value below the inter-quartile range indicates the project is performing more efficiently than most projects in the data set for that metric as a value above the inter-quartile range indicates poor or inefficient performance when compared to the sample size.

**INPATIENT HOSPITAL – JULY 2017**

**CONSTRUCTION INDUSTRY INSTITUTE**

**HEALTH CARE BENCHMARKS**

**DGSF / BGSF**

- Minimum: 0.60
- First Quartile: 0.713
- Median: 0.741
- Third Quartile: 0.796
- Maximum: 0.937

**BGSF / # OF LICENSED BEDS**

- Minimum: 0
- First Quartile: 4,000
- Median: 6,000
- Third Quartile: 8,000
- Maximum: 12,000

**PROJECT COST / BGSF**

- Minimum: 0
- First Quartile: 527
- Median: 2,051
- Third Quartile: 10,785
- Maximum: 12,000

**CONSTRUCTION COST / BGSF**

- Minimum: 0
- First Quartile: 501
- Median: 823
- Third Quartile: 1,200
- Maximum: 1,500
BACKGROUND
Analysis of more than 50 inpatient units worldwide. Selected projects shown here represent projects with similarities to the client's facility--academic medical centers, cancer centers and 600+ bed hospitals.

1. UNIT AREA / BED
   ACUTE CARE UNIT

2. % SUPPORT AREA / UNIT
   ACUTE CARE UNIT

3. NET TO GROSS FACTOR
   ACUTE CARE UNIT

4. POD SIZE: BEDS
   ACUTE CARE UNIT

5. TYPICAL PATIENT ROOM SIZE
   ACUTE CARE UNIT

Inpatient unit area growth for 24-30-, and 36-bed units. (HKS, 2014)
Image credit: HKS

Patient room size growth: 1960-2019
Image credit: HKS
The Architect’s balancing Act: Geometry & Data
‘Data-Centric’ Process – Single Repository
Project Snapshot in dRofus

### Progress

<table>
<thead>
<tr>
<th>Metric</th>
<th>Data Points</th>
</tr>
</thead>
<tbody>
<tr>
<td># Rooms designed</td>
<td>1,600</td>
</tr>
<tr>
<td># Rooms with Room Data</td>
<td>1,200</td>
</tr>
<tr>
<td># Items in use (with occurrences)</td>
<td>400</td>
</tr>
<tr>
<td># Finishes</td>
<td>500</td>
</tr>
<tr>
<td># JSONs</td>
<td>1,800</td>
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</table>

### Key data

<table>
<thead>
<tr>
<th>Category</th>
<th>Data Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmed Areas: Gross Area</td>
<td>390,474</td>
</tr>
<tr>
<td>Programmed Areas: Net Area</td>
<td>390,474</td>
</tr>
<tr>
<td>Programmed Areas: Gross/Net factor</td>
<td>1</td>
</tr>
<tr>
<td>Designed Areas: Gross Area</td>
<td>73,542</td>
</tr>
<tr>
<td>Designed Areas: Net Area</td>
<td>541,835</td>
</tr>
<tr>
<td>Designed Areas: Gross/Net factor</td>
<td>0</td>
</tr>
<tr>
<td>Number of Rooms</td>
<td>1,935</td>
</tr>
<tr>
<td>Number of Items</td>
<td>622</td>
</tr>
<tr>
<td>Number of Occurrences</td>
<td>2,095,554</td>
</tr>
</tbody>
</table>

### WHAT

- PROGRAM
- FLOOR PLAN
- FINISH PLAN
- AREA VALIDATION
- PROGRAM MGMT
- DOCUMENTS
- DATA SHEETS
- FM DATABASE

### WHO

- Planner
- Designer
- Int. Designer
- Proj. Manager
- Proj. Architect
- Consultants
- Owner
Healthcare Program Function Structure
Area Validation: Sub Departments (D&T)

<table>
<thead>
<tr>
<th>Department</th>
<th>Program Area</th>
<th>Design Area</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactation Room</td>
<td>120</td>
<td>171.68</td>
<td></td>
</tr>
<tr>
<td>Physician Lounge</td>
<td>570</td>
<td>570.23</td>
<td></td>
</tr>
<tr>
<td>Staff Lounge</td>
<td>910</td>
<td>911.64</td>
<td></td>
</tr>
<tr>
<td>Male Toilet Room - Lounge</td>
<td>200</td>
<td>308.27</td>
<td></td>
</tr>
<tr>
<td>Female Toilet Room - Lounge</td>
<td>260</td>
<td>381.08</td>
<td></td>
</tr>
<tr>
<td>Automated Dispensing Unit - Scrn</td>
<td>35</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Physician Locker Room - Male</td>
<td>640</td>
<td>542.27</td>
<td></td>
</tr>
<tr>
<td>Staff Locker Room - Male</td>
<td>440</td>
<td>439.52</td>
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</tr>
<tr>
<td>Male Toilet / Shower Room</td>
<td>430</td>
<td>351.91</td>
<td></td>
</tr>
<tr>
<td>Physician Locker Room - Female</td>
<td>450</td>
<td>254.55</td>
<td></td>
</tr>
<tr>
<td>Staff Locker Room - Female</td>
<td>250</td>
<td>529.39</td>
<td></td>
</tr>
<tr>
<td>On-Call Room</td>
<td>200</td>
<td>119.99</td>
<td></td>
</tr>
<tr>
<td>Female Toilet / Shower Room</td>
<td>480</td>
<td>292.01</td>
<td></td>
</tr>
<tr>
<td>On-Call Toilet / Shower</td>
<td>140</td>
<td>192.06</td>
<td></td>
</tr>
<tr>
<td>OR Support / Storage</td>
<td>2600</td>
<td>1203.38</td>
<td></td>
</tr>
<tr>
<td><strong>Diagnostic &amp; Treatment Total</strong></td>
<td><strong>7725</strong></td>
<td><strong>6267.58</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Grand Total**

- **7725**
- **6267.58**
Web Analytics

Area Validation: Area per Function

**Programmed vs Actual**

- **Number of Rooms Per Function**
- **Statistics**
  - Programmed Areas: Gross 62300
  - Programmed Areas: Net Area 62300
  - Programmed Areas: Gross/Net 1
  - Designed Areas: Gross Area 83789
  - Designed Areas: Net Area 61089
  - Designed Areas: Gross/Net 1
  - Number of Rooms 561
  - Number of Items 622
  - Number of Occurrences 226
Room Finishes and Furniture Status Reports

Room Data Sheets Status Reports

Equipment List Status
Web Viewer: IFC Model
dRofus: ITEMS

Interior Design Workflow

- **FINISHES LIST**
  - wall
  - floor
  - ceiling
  - base

- **ITEM OVERVIEW**
  - seating
  - tables
  - outdoor
  - other

- **FURNITURE LIST**
  - Furniture List Creation in Item Groups
  - Adding Supplier Info
  - Connecting Revit Families to Furniture Items
  - Ability to dump Furniture in Revit Room based on Occurrence assignment in dRofus
  - Item Overview
  - Item Groups
  - Adding Items: have an items list copied from HKS template database as a starting list
  - Specifications Menu (Manufacturer, Color, Size, Style, Installation Instructions)
  - Company: Pre-Populate a list of preselected manufacturers’ and suppliers

- Equipment
  - Equipment List
  - Medical Equipment
  - Med Equipment List
  - Link to Revit Family
  - Responsibility User Group
  - Report
Furniture Reports in dRofus
Design Decisions Life Cycle:
Reduces Redundancy and Increases Efficiency

- Real-Time Cloud based tool to speed up workflows
- HKS Templates for Typical Room Typologies to reduce redundancy and repetitive work for projects of similar types / clientele.
- Streamlined Planning and Programming directly ties to our documentation & project delivery tool: Revit
- Function Performance Evaluation Reports can be fed back to the Rooms Database to improve future projects

- Analyze, interpret, observations to create a ‘Best In Class’ Room Typologies each year
- Save Change Lists, create Audit Trails
- Capture our work process > Analyse the waste > Implement better processes by providing project metrics.
DATA  

KNOWLEDGE  

IMPROVE
SUPPORT METRICS - 2018

# of Tickets per Product

Revit Tickets per Category

Revit

Bluebeam

Sketch-Up

Lumion

3DS Max & V-Ray

All Other
• **Data Driven Decisions**: Tap into multiple data sources, to create insights

• **Data Centric Planning** and **Data Driven Design**: Leverage new tools that enhance our workflows

• **Data Driven Support**: Analyze your **Revit Model Data** to have better project implementation

• **Data Driven Culture**: Share outcomes, Improve training, Craft new skills & roles!